CLAIMS

What is claimed is:

1. A polarizer comprising at least one subwavelength optical microstructure wherein said microstructure is partially covered with a light-transmissive inhibiting surface.

2. The polarizer of Claim 1 wherein the inhibiting surface includes a reflective surface.

3. The polarizer of Claim 2 wherein the reflective surface includes a metalized coating.

4. The polarizer of Claim 1 wherein the inhibiting surface includes an absorptive surface.

5. The polarizer of Claim 1 wherein the optical microstructure includes a moth-eye structure.

6. The polarizer of Claim 1 wherein the optical microstructure includes linear prisms.

7. The polarizer of Claim 1 wherein the light is visible light.

8. The polarizer of Claim 1 wherein the optical microstructure includes a flat surface upon which the light-transmissive inhibiting surface is disposed.

9. The polarizer of Claim 1 wherein the optical microstructure includes peaks and valleys, wherein the inhibiting surface is primarily disposed on the peaks.

10. The polarizer of Claim 9 wherein the inhibiting surface is disposed on one side of substantially all of the peaks.

11. The polarizer of Claim 9 wherein the inhibiting surface is disposed on each side of substantially all of the peaks.

12. The polarizer of Claim 1 further comprising a coating disposed over at least part of the optical microstructure and the inhibiting surface.

13. The polarizer of Claim 12 wherein the coating is formed into at least one linear prism.

14. The polarizer of Claim 12 wherein the coating is formed into at least one cube-corner prism.

15. The polarizer of Claim 12 wherein the coating is formed into at least one lens.

16. The polarizer of Claim 12 wherein the coating is formed into at least one diffuser.

17. The polarizer of Claim 1 further comprising a passivation layer disposed on at least part of the optical microstructure and the inhibiting surface.

18. The polarizer of Claim 1 further comprising a surface relief diffuser disposed on at least part of the optical microstructure and the inhibiting surface.

19. A polarizer comprising at least one moth-eye structure having a partially metalized surface.

20. A polarizer comprising a substrate having a partially diffuse surface for reflecting light in a first plane incident upon the surface while allowing light along a second plane to pass through the substrate, wherein the first plane and the second plane are substantially perpendicular.

21. The polarizer of Claim 20 wherein the diffuse surface includes a surface relief diffuser.

22. A polarizer comprising a substrate having at least one moth-eye structure formed thereon, the moth-eye structure having a partially diffuse or reflective surface.

23. A polarizer comprising a substrate having a plurality of linear prisms formed thereon, the linear prisms having a partially metalized surface.

24. A polarizer comprising a substrate having at least one moth-eye structure formed thereon, wherein at least part of the surface of the moth-eye structure includes a conductive surface.

25. The polarizer of Claim 24 wherein the reflective surface includes a metalized coating.

26. The polarizer of Claim 24 wherein the substrate and the moth-eye structure are formed from the same material.

27. The polarizer of Claim 24 wherein the polarizer is formed on a retroreflective cube-corner prism.

28. The polarizer of Claim 24 wherein the polarizer is formed on a linear prism.

29. The polarizer of Claim 24 wherein the polarizer is formed on a lens.

30. The polarizer of Claim 29 wherein the lens is selected from the group consisting of lenticulars, linear bar lenses, single lenses, and lens arrays.

31. The polarizer of Claim 24 further comprising a transparent coating disposed over at least part of the surface.

32. The polarizer of Claim 31 wherein the transparent coating is in the form of a linear prism.

33. The polarizer of Claim 31 wherein the transparent coating is in the form of a cube-corner prism.

34. The polarizer of Claim 31 wherein the transparent coating is in the form of a lens.

35. The polarizer of Claim 24 wherein the moth-eye structure includes flat surfaces, the flat surfaces being metalized.

36. The polarizer of Claim 24 further comprising a second and third moth-eye structure formed on either side of the polarizer.

37. A polarizer comprising a plurality of moth-eye microstructures disposed on one another.

38. A polarizer comprising a plurality of subwavelength optical microstructures disposed on one another.

39. The polarizer of Claim 38 wherein the plurality of subwavelength optical microstructures includes at least 40 microstructures.

40. The polarizer of Claim 38 wherein a fill layer is provided between substantially all of the microstructures.

41. The polarizer of Claim 40 wherein the fill layer has a different index of refraction than the microstructures.

42. A polarizer for use in a liquid crystal display, the polarizer comprising at least one subwavelength optical microstructure having a pattern of metalized coating formed thereon for polarizing light and for carrying an electric current.

43. The polarizer of Claim 42, wherein the subwavelength optical microstructure includes a plurality of channels for aligning liquid crystals.

44. A liquid crystal display comprising:

a first polarizer including at least one subwavelength optical microstructure having at least part of a surface covered with a metalized coating for polarizing incoming light, the metalized coating also carrying an electric current;

a second polarizer adjacent to the first polarizer, the second polarizer being 90 degrees offset relative to the first polarizer; and

a plurality of liquid crystals disposed between the first and second polarizers.

45. The liquid crystal display of Claim 44, wherein the second polarizer includes at least one subwavelength optical microstructure having a pattern of metalized coating formed thereon for polarizing light and for carrying an electric current.

46. A filter comprising:

at least one subwavelength optical microstructure having at least part of a surface covered with a light-transmission inhibiting surface; and

a resonance structure adjacent to the microstructure for reflecting light that has passed through the microstructure having a predetermined wavelength.

47. A method of forming a polarizer comprising partially covering a subwavelength optical microstructure with a light-transmissive inhibiting surface.

48. The method of Claim 47 wherein the microstructure includes peaks and valleys, further comprising covering one side of substantially all of the peaks with the light-transmissive inhibiting surface.

49. The method of Claim 48 further comprising covering both sides of substantially all of the peaks with the light-transmissive inhibiting surface.

50. The method of Claim 47 further comprising covering the microstructure and inhibiting surface with a coating.

51. The method of Claim 50 further comprising forming the coating into at least one of a linear prism, a cube-corner prism, a lens, or a diffuser.

52. The method of Claim 47 wherein the inhibiting surface includes spaced apart, substantially parallel surfaces.

53. The method of Claim 47 further comprising forming the microstructure on a substrate having a different index of refraction than the microstructure.

54. A method of forming a polarizer comprising stacking a plurality of subwavelength optical microstructures on one another.

55. The method of Claim 54 wherein the microstructures include moth-eye structures.

56. The method of Claim 54 further comprising providing a fill layer between at least two microstructures.

57. A method of forming a liquid crystal display comprising:

providing a first polarizer including at least one subwavelength optical microstructure having at least part of a surface covered with a metalized coating for polarizing incoming light and for carrying an electric current;

positioning a second polarizer adjacent to the first polarizer and 90 degrees offset relative to the first polarizer; and

providing a plurality of liquid crystals between the first and second polarizers.

58. The method of Claim 57, wherein the second polarizer includes at least one subwavelength optical microstructure, further comprising patterning a metalized coating on the microstructure for polarizing light and for carrying an electric current.

59. A method of forming a filter comprising:

partially covering at least one subwavelength optical microstructure with a light-transmissive inhibiting surface; and

providing a resonance structure adjacent to the microstructure for reflecting light that has passed through the microstructure having a predetermined wavelength.